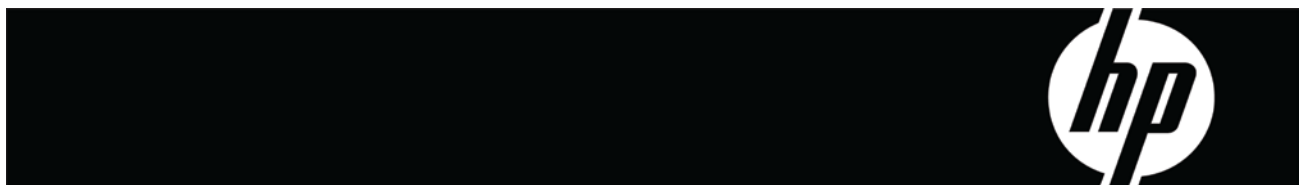


HP ProLiant DL288 G6 Server

Software Configuration Guide



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System BIOS configuration

This chapter describes the basic functions of the *AMIBIOS* software.

System BIOS overview

A Basic Input/Output System, or BIOS, is a set of programs permanently stored in an EEPROM chipset located on the system board. These programs serve as an interface between the server's hardware components and its operating system. This HP ProLiant DL288 G6 server features the *AMIBIOS* software—a ROM BIOS-based diagnostic tool that monitors system activity and performs constant hardware testing to ensure proper system operation.

AMIBIOS software

The *AMIBIOS* software serves three functions:

- Configure the system settings via the *AMIBIOS* Setup Utility
Using the Setup Utility, you can install, configure, and optimize the hardware devices on your system (such as clock, memory, and hard drives).
- Initialize hardware at boot via POST routines
At power-on or reset, the software performs Power-On Self Test (POST) routines to test system resources and run the operating system.
- Perform run-time routines
Using the software, perform basic hardware routines that can be called from DOS and Microsoft Windows applications.

AMIBIOS Setup Utility

NOTE: For ease of reading, the *AMIBIOS* Setup Utility will be referred to as “Setup” or “Setup Utility” in this guide. Also, the screenshots used in this guide display default system values. These values may not be the same as those in your server.

The *AMIBIOS* Setup Utility is a hardware configuration program built into the server BIOS. Because most systems are already properly configured and optimized, there is normally no need to run this utility.

You need to run this utility under the following conditions:

- When changing the system configuration, including:
 - Setting the system time and date
 - Configuring the hard drives
 - Specifying the boot device sequence
 - Configuring the power management modes
 - Setting up system passwords or making other changes to the security setup

- When a configuration error is detected by the system and you are prompted by a "Run Setup" message to make changes to the BIOS settings.

NOTE: If you repeatedly receive "Run Setup" messages, the battery located on the system board may be defective. In this case, the system cannot retain configuration values in CMOS. Ask a qualified technician for assistance.

The Setup Utility loads the configuration values in a battery-backed nonvolatile memory called CMOS RAM. This memory area is not part of the system RAM, which allows configuration data to be retained when power is turned off. The values take effect when the system is booted. POST uses these values to configure the hardware. If the values and the actual hardware do not agree, POST generates an error message. You must run the Setup Utility to change the BIOS settings from the default or current configuration.

Accessing the Setup Utility

1. Turn on the monitor and the server.

If the server is already turned on, save your data and exit all open applications, and then restart the server.

During POST, press **F10**. If you fail to press **F10** before POST is completed, you need to restart the server and repeat this step. The first page displayed is the Main menu. Use the left (←) and right (→) arrow keys to move between selections on the menu bar.

Navigating through the Setup Utility

Use the keys listed in the legend bar on the bottom of the Setup Utility screen to access the various menu and submenu screens of the Setup Utility. **Table 1** lists these legend keys and their respective functions.

Table 1 Setup Utility Navigation Keys

Key	Function
← and →	Select different screens.
↑ and ↓	Select items in each menu.
Enter, Tab, or Shift-Tab	Select a field value or display a submenu screen. Display more options for items marked with ►.
Esc	Exit the CMOS Setup menu.
<+>, <->	Configure the system time or change field.
F1	To bring up the General Help window. The General Help window describes other Setup navigation keys that are not displayed on the legend bar.
F10	To save changes and exit the CMOS Setup Utility.

Setup Utility menus

The Setup Utility menu bar displays the five primary menu selections. For detailed information and screenshots of these Setup Utility menus and their related submenus, refer to the following sections.

Main menu

Figure 1 Main menu

ROM-based Setup Utility		
<Main> <Advanced> Boot Security Exit		
System Overview		Use [ENTER], [TAB] or [SHIFT-TAB] to select a field.
Product Name:	ProLiant DL288 G6	
ProLiant BIOS:	O33	
Build Date:	03/31/2010	Use [+] or [-] to configure system time.
ROM ID	18DIM200	
Processor		
Intel(R) Xeon(R) CPU	E5640 @ 2.67GHz	
Speed:	2666MHz	
Count:	1	
System Memory		←→ Select Screen
Size:	2048MB	↑↓ Select Item
		+ - Change Field
System Time	[02:52:30]	Tab Select Field
System Date	[Thu 03/18/2010]	F1 General Help
System Serial Number		F10 Save and Exit
NIC#1 MAC Address	F4-CE-46-80-04-86	ESC Exit
NIC#2 MAC Address	F4-CE-46-80-04-87	
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NOTE: The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30, P.M. as 17:30:00.

Table 2 Main menu fields

Field	Description	Options
Product Name	Display the product name of the system.	
ProLiant BIOS	Display the BIOS family.	
Build Date	Display the date when this version of BIOS was built.	
ROM ID	Display the ID of the ROM.	
Processor	Display the detailed processor information.	
System Memory	Displays the amount of conventional memory detected during POST.	
System Time	Adjust the system time.	
System Date	Adjust the system date.	
System Serial Number	Display the System Serial Number.	
NIC#1 MAC Address	Display the MAC address of NIC1.	
NIC#2 MAC Address	Display the MAC address of NIC2.	
Asset Tag	Configure asset tag settings.	
POST F1 Prompt	Set this value to allow wait of up to 15 seconds for an F1 press. This is the default setting	Delayed
	Set this value to wait indefinitely for an F1 press.	Enable
	Set this value to continue booting without waiting for an F1 press.	Disabled

Advanced menu

Figure 2 Advanced menu

ROM-based Setup Utility	
Main <Advanced> Boot Security Exit	
Advanced Settings	Custom: Allow to
WARNING: Setting wrong values in below sections may cause system to malfunction.	configure Efficiency
	/Performance related
	items individually.
	Efficiency
Power Efficiency Mode [Efficiency]	/Performance: Impact
Power Supply Redundancy Mode [High Efficiency]	groups as CPU
> CPU Configuration	Configuration/CPU
> CPU Bridge Configuration	bridge Configuration
> SATA Configuration	/PCI Express
> SuperIO Configuration	Configuration
> USB Configuration	
> PCI Configuration	←→ Select Screen
> PCI Express Configuration	↑↓ Select Item
> IPMI Configuration	+ - Change Option
> BIOS Serial Console Configuration	F1 General Help
> Trusted Computing	F10 Save and Exit
	ESC Exit
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NOTE: The CPU Configuration setup screen can vary depending on the installed processor.

Table 3 Advanced menu fields

Field	Description	Options
Power Efficiency Mode	BIOS will initialize all power related processor and chipset settings to maximize the performance per Watt value as measured by SpecPower.	Efficiency
	BIOS will initialize all power related processor and chipset settings to maximize the performance of the server.	Performance
	The user has modified the configuration of power/performance related settings individually. User selection of this option is not allowed, It is only informational based on other changes the user has made to SETUP options. When user set "Power Efficiency Mode" to Custom, the user can change all power related processor and chipset settings freely.	Custom
CPU Configuration	Configure advanced CPU settings.	

Table 3 Advanced menu fields

Field	Description	Options
CPU Bridge Configuration	Configure CPU Bridge chipset settings.	
SATA Configuration	Configure SATA device settings.	
SuperIO Configuration	Configure PILOT Super I/O chipset settings.	
USB Configuration	Configure USB controller settings.	
PCI Configuration	Configure PCI settings.	
PCI Express Configuration	Configure PCI Express settings.	
IPMI Configuration	Configure IPMI 2.0 settings.	
BIOS Serial Console Configuration	Configure BIOS Serial Console settings.	
Trusted Computing	Configure Trusted Computing settings.	

CPU Configuration submenu

Figure 3 CPU Configuration submenu

ROM-based Setup Utility		
<Advanced>		
Configure advanced CPU settings Module Version: 01.09		When enabled, a VMM can utilize the additional HW Caps provided by Intel(R) Virtualization Tech. Note: A full reset is required to change the setting.
Manufacturer:	Intel	
Intel(R) Xeon(R) CPU	E5640 @ 2.67GHz	
Frequency:	2.66GHz	
BCLK Speed:	133MHz	
Cache L1:	256 KB	
Cache L2:	1024 KB	
Cache L3:	12288KB	
C1E Support	[Enabled]	
Hardware Prefetcher	[Enabled]	
Adjacent Cache Line Prefetch	[Enabled]	↔ Select Screen
DCU Prefetcher	[Enabled]	↑↓ Select Item
Data Reuse	[Enabled]	+ - Change Option
Intel VT-d	[Enabled]	F1 General Help
Intel (R) Virtualization Tech	[Enabled]	F10 Save and Exit
Execute-Disable Bit Capability	[Enabled]	ESC Exit
Intel (R) HT Technology	[Enabled]	
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Table 4 CPU Configuration submenu fields

Field	Description	Options
Module Version	Display the module version of the processor.	
Manufacture	Display the manufacture of the processor.	
Frequency	Display the frequency of the processor.	
BCLK Speed	Display the BCLK speed of the processor.	
Cache	Display the cache of the processor.	
C1E Support	C1E (Extended HALT state) enabled via the BIOS. This is the default setting.	Enabled
	Disables support for adjacent cache line prefetch debug function.	Disabled
Hardware Prefetcher	Enable the hardware components that are used in conjunction with software programs to prefetch data in order to shorten execution cycles and maximize data processing efficiency.	Enabled

Table 4 CPU Configuration submenu fields

Field	Description	Options
	Disable the hardware components that are used in conjunction with software programs to prefetcher data in order to shorten execution cycles and maximize data processing efficiency.	Disabled
Adjacent Cache Line Prefetch	Enable the Adjacent Cache Line Prefetch feature. This is the default setting.	Enabled
	Disable the Adjacent Cache Line Prefetch feature.	Disabled
DCU Prefetcher	Enabling the DCU Prefetcher is intended to speed up data accessed by a program by prefetching to the L1 data cache. DCU prefetching improves performance if data in large structures is arranged sequentially in the order used by the program.	Enabled
	If data access patterns are sparse instead of local, some performance degradation can occur under high CPU load due to bandwidth issues. In such cases, disabling DCU Prefetcher may improve performance.	Disabled
Data Reuse	Data Reuse reduces the frequency of L3 cache updates from the L1 cache. In most cases, this improves performance by reducing the internal bandwidth consumed by constant updates of L1 cache lines in the L3 cache.	Enabled
	However, since this behavior can result in more requests to main memory, in some cases, overall performance may be degraded. Whether Data Reuse should be enabled or disabled for a particular workload will depend on the memory access patterns of the workload.	Disabled
Intel VT-d	Enable Intel's Virtualization Technology support for Direct I/O VT-d. This feature offers fully-protected I/O resource-sharing across the Intel platforms, providing the user with greater reliability, security and availability in networking and data-sharing.	Enabled
	Disable VT-d.	Disabled
Intel (R) Virtualization Tech	Turn on hardware virtualization support. A full system reset is required after changing this value.	Enabled
	Turn off hardware virtualization support. A full system reset is required after changing this value.	Disabled
Execute-Disable Bit Capability	When enabled, train the XD feature flag to always return 0. This is the default setting.	Enabled
	When disabled, force the XD feature flag to always return 0	Disabled
Intel (R) HT Technology	Enable Simultaneous Multi-Threading.	Enabled
	Disable Simultaneous Multi-Threading.	Disabled
Active Processor Cores	All cores active.	All
	1 core active.	1
	2 cores active.	2
A20M	Enable A20M (when needed for legacy OSes / applications)	Enabled
	Disable A20M	Disabled

Table 4 CPU Configuration submenu fields

Field	Description	Options
Intel(R) SpeedStep(tm) tech	Enable GV3.	Enabled
	Disable GV3.	Disabled
Intel(R) TurboMode tech	Enable processor cores to run faster than marked frequency in specific conditions. Note that SpeedStep must be enabled in order to enable TurboMode.	Enabled
	Disable processor cores to run faster than marked frequency in specific conditions	Disabled
Intel(R) C-STATE tech	Enable CPU idle C2/C3/C4. Enabling it will allow the OS to make the cores run at different frequencies, thus making optimum use of power.	Enabled
	Disable CPU idle C2/C3/C4. Cores will run at the same frequency.	Disabled

CPU Bridge Configuration submenu

Figure 4 CPU Bridge Configuration submenu

ROM-based Setup Utility		
<Advanced>		
CPU Bridge Chipset Configuration submenu		To transfer the QPI Links to full-speed or leave them in slow-mode
CPU Revision	A0	
Current QPI Frequency	5.866GT	
Current Memory Frequency	1333 Mhz	
Current Memory Mode	Sparing	
QPI Links Speed	[Full-Speed]	
QPI Frequency	[Auto]	
QPI L0s and L1	[Enabled]	
Memory Frequency	[Auto]	
Memory Speed with 20PC	[1066MHz@1.35V]	
Advanced Memory Protection	[Independent]	←→ Select Screen
Note Interleaving	[Disabled]	↑↓ Select Item
Memory Interleaving	[Full Interleaving]	+ - Change Option
QPI Optimization	[Balanced]	F1 General Help
Demand Scrubbing	[Enabled]	F10 Save and Exit
Patrol Scrubbing	[Disabled]	ESC Exit
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Table 5 CPU Bridge Configuration submenu fields

Field	Description	Options
CPU Revision	Display the CPU revision.	
Current QPI Frequency	Display the current QPI frequency.	
Current Memory Frequency	Display the current memory frequency.	
Current Memory Mode	Display the current memory mode.	
QPI Links Speed	Transit the QPI links to full-speed.	Full-Speed
	Transit the QPI links to slow mode	Slow Mode
QPI Frequency	QuickPath Interconnect (QPI) is the connection between the CPUs and I/O hub. Transit the links to the auto speed when transitioning the links to full-speed.	Auto

Table 5 CPU Bridge Configuration submenu fields

Field	Description	Options
	Transit the links to 4.800GT when transitioning the links to full-speed.	4.800GT
	Transit the links to 5.866GT when transitioning the links to full-speed.	5.866GT
	Transit the links to 6.400GT when transitioning the links to full-speed.	6.400GT
QPI L0s and L1	This enables the QPI power state to lower power consumption. L0s and L1 are automatically selected by the motherboard. Enabled L0s and L1.	Enabled
	Disabled L0s and L1.	Disabled
Memory Frequency	Transit the memory frequency to the maximum speed.	Auto
	Transit the memory frequency to the 800MHz.	Force DDR-800
	Transit the memory frequency to the 1066MHz.	Force DDR-1066
	Transit the memory frequency to the 1333MHz.	Force DDR-1333
Memory Mode	Configure the memory to work in independent channel.	Independent
	Configure the memory to work in mirrors channel space between channels.	Channel Mirroring
	Configure the memory with Lockstep between channel 0 and 1.	Lockstep
Memory Inter leaving	Memory controller should be configured as interleaved whenever possible.	Enabled
	Memory controller should be configured as interleaved whenever possible.	Disabled
Demand Scrubbing	Demand scrubbing solves the problem of obtaining multiple correctable errors due to a single soft error, and thus the problem of potentially reporting a correctable threshold error due to soft errors. Allow to scrub ECC demand.	Enabled
	Disable to scrub ECC demand.	Disabled
Patrol Scrubbing	Background scrubbing (also known as patrol scrubbing) is a memory error-correction scheme that works in the background looking for and correcting resident errors. Instead of only reading the data and ECC bits, correcting them, and writing them back to memory when a correctable memory error occurs, the system will constantly be reading and writing memory locations. Thus, the system will be constantly scrubbing all of the contents of memory in an effort to correct soft errors before a correctable error even occurs. Allow to scrub ECC patrol.	Enabled
	Disable to scrub ECC patrol.	Disabled

SATA Configuration submenu

Figure 5 SATA Configuration submenu with Disabled mode

ROM-based Setup Utility		
<Advanced>		
SATA Configuration		Options
SATA#1 Controller Mode	[Disabled]	Disabled
SATA#2 Controller Mode	[Enabled]	Compatible
		RAID
> Primary IDE Master:	[Not Detected]	AHCI
> Secondary IDE Master:	[Not Detected]	
Embedded SAS/SATA Link Rate	[Auto]	
		←→ Select Screen ↑↓ Select Item + - Change Option F1 General Help F10 Save and Exit ESC Exit
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Table 6 SATA Configuration submenu fields with Disabled mode

Field	Description	Options
SATA#1 Controller Mode	SATA controller is disabled and does not appear in the standard boot order list.	Disabled
SATA#2 Controller Mode	Enable SATA#2 Controller.	Enabled
	Disable SATA#2 Controller.	Disabled
Primary IDE Master	Primary IDE Master not detected.	Not Detected
Secondary IDE Master	Secondary IDE Master not detected.	Not Detected

Figure 6 SATA Configuration submenu with Compatible mode

ROM-based Setup Utility		
<Advanced>		
SATA Configuration		Options
SATA#1 Controller Mode	[Compatible]	Disabled
SATA#2 Controller Mode	[Enabled]	Compatible
		RAID
		AHCI
> Primary IDE Master:	[Not Detected]	
> Primary IDE Slave:	[Not Detected]	
> Secondary IDE Master:	[Not Detected]	
> Secondary IDE Slave:	[Not Detected]	
> Third IDE Master:	[Not Detected]	
> Fourth IDE Master:	[Not Detected]	
Drive Write Cache	[Disabled]	
Embedded SAS/SATA Link Rate	[Auto]	
		←→ Select Screen
		↑↓ Select Item
		+ - Change Option
		F1 General Help
		F10 Save and Exit
		ESC Exit
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Table 7 SATA Configuration submenu fields with Compatible mode

Field	Description	Options
SATA#1 Controller Mode	Legacy Native mode, supports up to 4 drives.	Compatible
SATA#2 Controller Mode	Enable SATA#2 Controller.	Enabled
	Disable SATA#2 Controller.	Disabled
Primary IDE Master	Primary IDE Master not detected.	Not Detected
Primary IDE Slave	Primary IDE slave not detected.	Not Detected
Secondary IDE Master	Secondary IDE Master not detected.	Not Detected

Table 7 SATA Configuration submenu fields with Compatible mode

Field	Description	Options
Secondary IDE Slave	Secondary IDE slave not detected.	Not Detected
Third IDE Master	Third IDE Master not detected.	Not Detected
Fourth IDE Master	Fourth IDE Master not detected.	Not Detected

Figure 7 SATA Configuration submenu with RAID mode

ROM-based Setup Utility		
<Advanced>		
SATA Configuration		Options
SATA#1 Controller Mode	[RAID]	Disabled Compatible RAID AHCI
> SATA Port1:	[Not Detected]	
> SATA Port2:	[Not Detected]	
> SATA Port3:	[Not Detected]	
> SATA Port4:	[Not Detected]	
> Primary IDE Master:	[Not Detected]	
> Secondary IDE Master:	[Not Detected]	
Embedded SAS/SATA Link Rate	[Auto]	←→ Select Screen ↑↓ Select Item + - Change Option F1 General Help F10 Save and Exit ESC Exit
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Table 8 SATA Configuration submenu fields with RAID mode

Field	Description	Options
-------	-------------	---------

SATA#1 Controller Mode	L Only available on systems with an embedded software RAID option ROM.	RAID
SATA Port1	SATA Port1 not detected.	Not Detected
SATA Port2	SATA Port2 not detected.	Not Detected
SATA Port3	SATA Port3 not detected.	Not Detected
SATA Port4	SATA Port4 not detected.	Not Detected
Primary IDE Master	Primary IDE Master not detected.	Not Detected
Secondary IDE Master	Secondary IDE Master not detected.	Not Detected

ROM-based Setup Utility		
<Advanced>		
SATA Configuration		Options
SATA#1 Controller Mode	[AHCI]	Disabled Compatible RAID AHCI
> AHCI Port1:	[Not Detected]	
> AHCI Port2:	[Not Detected]	
> AHCI Port3:	[Not Detected]	
> AHCI Port4:	[Not Detected]	
> AHCI Port5:	[Not Detected]	
> AHCI Port6:	[Not Detected]	
Drive Write Cache	[Disabled]	
Embedded SAS/SATA Link Rate	[Auto]	
		←→ Select Screen ↑↓ Select Item + - Change Option F1 General Help F10 Save and Exit ESC Exit
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Table 9 SATA Configuration submenu fields with AHCI

Field	Description	Options
SATA#1 Controller Mode	This should be the DEFAULT if NCQ Mode requires that AHCI also be enabled. Otherwise, legacy SATA Native Mode should be the DEFAULT as previously specified.	AHCI
AHCI Port1	AHCI Port1 not detected.	Not Detected
AHCI Port2	AHCI Port2 not detected.	Not Detected
AHCI Port3	AHCI Port3 not detected.	Not Detected
AHCI Port4	AHCI Port4 not detected.	Not Detected
AHCI Port5	AHCI Port5 not detected.	Not Detected
AHCI Port6	AHCI Port6 not detected.	Not Detected

Super IO Configuration submenu

Figure 8 Super IO Configuration submenu

ROM-based Setup Utility		
<Advanced>		
Configure PILOT Super IO Chipset		Allows BIOS to Select Embedded Serial Port Base Addresses.
Embedded Serial Port Address	[3F8/IRQ4]	
Serial Port Interrupt setting	[Edge trigger]	
		←→ Select Screen ↑↓ Select Item + - Change Option F1 General Help F10 Save and Exit ESC Exit
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Table 10 Super IO submenu fields

Field	Description	Options
Embedded Serial Port Address	Set this value to prevent the serial port from accessing any system resources. When this option is set to Disabled, the serial port physically becomes unavailable.	Disabled
	Set this value to allow the serial port to use 2F8 as its I/O port address and IRQ 3 for the interrupt address. If the system will not use a serial device, it is best to set this port to Disabled.	2F8/IRQ3
	Set this value to allow the serial port to use 3E8 as its I/O port address and IRQ 4 for the interrupt address. If the system will not use a serial device, it is best to set this port to Disabled.	3E8/IRQ4
	Set this value to allow the serial port to use 2E8 as its I/O port address and IRQ 3 for the interrupt address. If the system will not use a serial device, it is best to set this port to Disabled.	2E8/IRQ3

Table 10 Super IO submenu fields

Field	Description	Options
	Set this value to allow the serial port to use 3F8 as its I/O port address and IRQ 4 for the interrupt address. This is the default setting. The majority of serial port 1 or COM1 ports on computer systems use IRQ4 and I/O Port 3F8 as the standard setting. The most common serial device connected to this port is a mouse. If the system will not use a serial device, it is best to set this port to Disabled.	3F8/IRQ4

USB Configuration submenu

Figure 9 USB Configuration submenu

ROM-based Setup Utility		
<Advanced>		
USB Configuration		Options
Module Version – 2.24. 4-13.4		Disabled Enabled
USB Devices Enabled: 1 Keyboard, 2 Mouse, 1 Drive		
USB Functions	[Enabled]	
Legacy USB Support	[Enabled]	
USB 2.0 Controller	[Enabled]	
USB 2.0 Controller Mode	[HiSpeed]	
BIOS EHCI Hand-Off	[Enabled]	
Hot-plug USB FDD Support	[Auto]	←→ Select Screen ↑↓ Select Item + - Change Option F1 General Help F10 Save and Exit ESC Exit
> USB Mass Storage Device Configuration		
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Table 11 USB Configuration submenu fields

Field	Description	Options
Module Version	Display USB module version.	
USB Devices Enabled	Display the enabled USB devices in system.	
USB Functions	Enable USB functions.	Enabled
	Disable USB functions.	Disabled
Legacy USB Support:	Enable support for Legacy USB devices.	Enabled
	Disable support for Legacy USB devices.	Disabled
	Disable legacy support if no USB devices are connected.	Auto
USB 2.0 Controller:	Enable USB 2.0 support.	Enabled
	Disable USB 2.0 support.	Disabled
USB 2.0 Controller Mode:	Set the USB 2.0 Controller to full-speed.	FullSpeed

Table 11 USB Configuration submenu fields

Field	Description	Options
	Set the USB 2.0 Controller to high-speed.	HiSpeed
BIOS EHCI Hand-Off	Set this value to enable EHCI hand-off support. This is the default value.	Enabled
	Set this value to disable EHCI hand-off support. This is used when your OS does not support EHCI hand-off.	Disabled
Hot-plug USB FDD Support	Set this value to enable Hot-plug USB FDD support.	Enabled
	Clear this value to disable Hot-plug USB FDD support.	Disabled
	Auto option creates this dummy device only if there is no FDD present.	Auto
USB Mass Storage Device Configuration	Access the submenu to configure USB Mass Storage Device.	

PCI Configuration submenu

Figure 10 PCI Configuration submenu

ROM-based Setup Utility		
<Advanced>		
PCI Configuration		Select which graphics controller to use as the primary boot device.
Embedded VGA Control	[Auto Detect]	
Embedded NIC Port 1 Control	[Enabled]	
Embedded NIC Port 1 PXE	[Enabled]	
Embedded NIC Port 2 Control	[Enabled]	
Embedded NIC Port 2 PXE	[Disabled]	
Wake-On LAN	[Enabled]	
		←→ Select Screen ↑↓ Select Item + - Change Option F1 General Help F10 Save and Exit ESC Exit
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Table 12 PCI Configuration submenu fields

Field	Description	Options
Embedded VGA Control	Always Enable Onboard VGA.	Always Enabled
	Enable add-in VGA once there is add-in VGA.	Auto Detect
Embedded NIC Port 1 Control	Enable Onboard NIC1.	Enabled
	Disable Onboard NIC1.	Disabled
Embedded NIC Port 1 PXE	Enable Onboard NIC1 PXE.	Enabled
	Disable Onboard NIC1 PXE.	Disabled
Embedded NIC Port 2 Control	Enable Onboard NIC2.	Enabled
	Disable Onboard NIC2.	Disabled

Table 12 PCI Configuration submenu fields

Field	Description	Options
Embedded NIC Port 2 PXE	Enable Onboard NIC2 PXE.	Enabled
	Disable Onboard NIC2 PXE.	Disabled
Wake-On LAN	Allow wake up in S4/S5 over LAN. This is the default setting.	Enabled
	Disabled Wake-On LAN in S4/S5.	Disabled

PCI Express Configuration submenu

Figure 11 PCI Express Configuration submenu

ROM-based Setup Utility	
<Advanced>	
PCI Express Configuration	
Active State Power-Management [Disabled]	
PCI Express Gen2 [Gen2]	
←→ Select Screen	
↑↓ Select Item	
F1 General Help	
F10 Save and Exit	
ESC Exit	
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Table 13 PCI Express Configuration submenu fields

Field	Description	Options
Active State Power Management	Enable the PCIe ports to enter L0s and/or L1 states.	Enabled
	Disable PCI Express L0s and L1 link power states. This option would be chosen by the user if there were compatibility issues with their PCIe option cards. It is the default setting.	Disabled
PCI Express Gen2	All PCI-E devices will only run in Gen 1 mode.	Gen 1
	For best possible performance. PCI-E devices, which support Gen 2 mode, will run in Gen 2 mode. PCI-E devices, which only support Gen 1 mode, will run in Gen 1 mode.	Gen 2

IPMI Configuration submenu

Figure 12 IPMI Configuration submenu

ROM-based Setup Utility		
<Advanced>		
IPMI 2.0 Configuration		InPut for Set LAN Configuration command.
Status of BMC	Working	NOTE: - Each question in this group may take considerable amount of time.
BMC Firmware Revision	09.57	
BMC/IPMI FW Date:	Jan/13/2010	
BMC SDR Version:	2.19.0.211	
Warehouse Build Number: 211		
>Set LAN Configuration		
>SEL Configuration		
>Hardware Health Information		
>Watchdog Configuration		
>Serial Port Configuration		
		↔ Select Screen
		↑↓ Select Item
		Enter Go to Sub Screen
		F1 General Help
		F10 Save and Exit
		ESC Exit
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Table 14 IPMI Configuration submenu fields

Field	Description	Options
Status of BMC	Display the current status of BMC.	
BMC Firmware Revision	Display the current revision of the BMC firmware.	
BMC/IPMI FW Date	Display the date of the BMC/IPMI firmware.	
BMC SDR Version	Display the current version of the BMC SDR.	
Set LAN Configuration	Access the submenu to configure Option of Set LAN Configuration.	
SEL Configuration	Access the submenu to configure Option of SEL Configuration.	
Serial Port Configuration	Access the submenu to configure Option of Serial Port Configuration.	

Table 14 IPMI Configuration submenu fields

Field	Description	Options
Watch Dog Configuration	Access the submenu to configure Option of Watch Dog Configuration.	
Hardware Health Status	Access the submenu to view Hardware Health Status.	

BIOS Serial Console Configuration submenu

Figure 13 BIOS Serial Console Configuration submenu

ROM-based Setup Utility		
<Advanced>		
Configure BIOS Serial Console type and parameters		Select BIOS Serial Console type.
BIOS Serial Console	[Disabled]	
		←→ Select Screen ↑↓ Select Item + - Change Option F1 General Help F10 Save and Exit ESC Exit
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Table 15 BIOS Serial Console Configuration submenu fields

Field	Description	Options
BIOS Serial Console	Enable to configure BIOS Serial Console type and parameters	Enabled
	Disable to configure BIOS Serial Console type and parameters	Disabled

Trusted Computing submenu

Figure 14 Trusted Computing submenu

ROM-based Setup Utility		
<Advanced>		
Trusted Computing		
TPM Status		Not Present

Table 16 Trusted Computing submenu fields

Field	Description	Options
TPM Status	TPM not present	Not Present
	Display TPM Status.	Present

Boot menu

Figure 15 Boot menu

ROM-based Setup Utility	
Main Advanced <Boot> Security Exit	
Boot Settings	Configure Settings during System Boot.
> Boot Settings Configuration	
>Standard Boot Order	
>Hard Disk Drives	
USB Device Boot Priority	[High]
Restore on AC Power Loss	[Last State]
	←→ Select Screen ↑↓ Select Item Enter Go to Sub Screen F1 General Help F10 Save and Exit ESC Exit
V02. 61(C) Copyright 1985-2006, American Megatrends, Inc.	

Table 17 Boot menu fields

Field	Description	Options
Boot Settings Configuration	Configure settings during system boot.	
Standard Boot Order	View and configure standard boot order settings.	
Hard Disk Drives	Display HDD information if detect HDD installed.	
USB Device Boot Priority	Force USB devices automatically showing up as top priority within their device class in the standard boot order list. This is the default setting.	High
	Train USB devices as original priority as the standard boot order list.	Low
Restore on AC Power Loss	Power off the server after power loss.	Power off
	Power on the server after power loss.	Power on

Table 17 Boot menu fields

Field	Description	Options
	Restore last state after power loss.	Last state

Boot Settings Configuration submenu

Figure 16 Boot Setting Configuration submenu

ROM-based Setup Utility		
<Boot>		
Boot Settings Configuration		Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
Quick Boot	[Enabled]	
Quiet Boot	[Enabled]	
Num Lock	[Enabled]	
		←→ Select Screen ↑↓ Select Item + - Change Option F1 General Help F10 Save and Exit ESC Exit
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Table 18 Boot Settings Configuration submenu fields

Field	Description	Options
Quick Boot	Allow BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.	Enabled
	Allow the BIOS to process the normal tests while booting.	Disabled
Quiet Boot	Display OEM Logo instead of POST messages	Enabled
	Display normal POST messages. This is the default setting.	Disabled
Num Lock	Set this value to allow Num Lock on the keyboard to be enabled automatically when the computer system is booted up. This allows the immediate use of the numeric keypad located on the right side of the keyboard. To confirm this, the Num Lock LED on the keyboard will be lit.	Enabled

Table 18 Boot Settings Configuration submenu fields

Field	Description	Options
	This option does not enable the keyboard Num Lock automatically. To use the numeric keypad, press the Num Lock key located on the upper left-hand corner of the numeric keypad. The Num Lock LED on the keyboard will light up when Num lock is engaged. This is the default setting.	Disabled

Standard Boot Order submenu

Figure 17 Standard Boot Order submenu

ROM-based Setup Utility		
<Boot>		
Standard Boot Order		Specifies the boot sequence from the available devices.
1st Boot Device	[Hard Drive]	
2nd Boot Device	[Network:IBA GE Slo]	A device enclosed in parenthesis has been disabled in the corresponding type menu.
		←→ Select Screen
		↑↓ Select Item
		+ - Change Option
		F1 General Help
		F10 Save and Exit
		ESC Exit
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Table 19 Standard Boot Order submenu fields

Field	Description	Options
1st Boot Device	Hard drive is the 1st boot device.	Hard drive
2nd Boot Device	Network:IBA GE Slo is the 2nd boot device.	Network:IBA GE Slo

Hard Disk Drives submenu

Figure 18 Hard Disk Drives submenu

ROM-based Setup Utility		
<Boot>		
Hard Disk Drives		Specifies the boot sequence from the available devices.
1st Drive	[SATA: 4M-GB0500C441]	
		←→ Select Screen ↑↓ Select Item + - Change Option F1 General Help F10 Save and Exit ESC Exit
V02. 61(C) Copyright 1985-2006, American Megatrends, Inc.		

Table 20 Hard Disk Drives submenu fields

Field	Description	Options
1st Drive	USB disk is the 1st drive.	USB: SanDisk USB F1

Security menu

Figure 19 Security menu

ROM-based Setup Utility	
Main Advanced Boot <Security> Exit	
Security Settings	Install or Change the Password.
Admin Password: Not Installed	
User Password: Not Installed	
Change Admin Password	
Boot Sector Virus Protection: [Disabled]	
	←→ Select Screen ↑↓ Select Item Enter Change F1 General Help F10 Save and Exit ESC Exit

Table 21 Security menu fields

Field	Description	Options
Admin Password Is	No Admin password is installed.	Not Installed
	An Admin password is installed.	Installed
User Password Is	A user password is not installed.	Not Installed
	A user password is installed.	Installed
Change Admin Password	Type the Supervisor's password in the dialogue box to set or to change Admin password, which allows access to the BIOS.	
Boot Sector Virus Protection	Enable boot sector virus protection.	Enabled
	Disable boot sector virus protection.	Disabled

Exit menu

The **Exit** menu displays several options for how to quit the Setup Utility. Select any of the exit options and press **Enter**.

Figure 20 Exit menu

ROM-based Setup Utility				
Main	Advanced	Boot	Security	<Exit>
Exit Options		Exit system setup after saving the changes.		
Save Changes and Exit		F10 key can be used for this operation..		
Discard Changes and Exit				
Discard Changes				
Restore Default Settings				
		←→ Select Screen		
		↑↓ Select Item		
		Enter Go to Sub Screen		
		F1 General Help		
		F10 Save and Exit		
		ESC Exit		
V02. 61(C) Copyright 1985-2006, American Megatrends, Inc.				

Table 22 Exit menu fields

Field	Description	Options
Save Changes and Exit	Save the changes made and exit the BIOS Setup Utility.	
Discard Changes and Exit	Exit the BIOS Setup utility without saving any changes you have made.	
Discard Changes	Discard (cancel) any changes you have made. Remain in the BIOS Setup Utility.	
Restore Default Settings	Restore Default Settings.	

Recording custom setup values

Write down the settings from the Setup Utility and keep them in a safe place. If you need to restore the custom values, you must run the Setup Utility and then reenter these custom settings. Having a record of these custom settings makes this much easier.

Loading system defaults

If the system fails after you make changes in the Setup Utility menus, reboot the server, enter Setup, and load the system default settings to correct the error. These default settings have been selected to optimize the server's performance. Setup default settings are quite demanding in terms of resource consumption. If you are using low-speed memory chips or other types of low-performance components and you choose to load these settings, the system might not function properly.

To load the system defaults:

1. Reboot the server in a normal manner.
2. During POST, press **F10** to access the Setup Utility.
3. Press **F9** to load the default values.
4. Choose **Save Changes and Exit** on the Exit menu, and press **Enter** to save the changes and close the Setup Utility.

Clearing CMOS

You may need to clear the Setup configuration values (CMOS) if the configuration has been corrupted, or if incorrect settings made in the Setup Utility have caused error messages to be unreadable. Clearing the CMOS data removes the supervisor password.

The clear CMOS setting is on the jumper block (J27-A) on the system board. Refer to your server hood label or the HP ProLiant DL288 G6 Server Maintenance and Service Guide for the location of this jumper block and the clear CMOS setting.

To clear CMOS:

1. Perform the pre-installation procedures described on page 45.
2. If necessary, remove any expansion boards, assemblies, or cables that prevent access to enable CMOS jumper block (J27-A).
3. Locate the clear CMOS jumper block (J27-A) on the system board.
4. Enable clear CMOS jumper block (J27-A) to clear the CMOS memory.
5. Perform the post-installation procedures as described on page 46.
6. During POST, press **F10** to access the Setup Utility.
7. Press **F9** to load the system default values.
8. Set time, date, and other system values.
9. Press **F10** to save the changes you made and to close the Setup Utility.

BIOS Recovery Steps

Steps to perform a BIOS recovery:

1. Prepare USB key for BIOS recovery.
 - a. On a system with Internet access, download the ROMPaq file for the restore BIOS from hp.com.
 - b. Run the ROMPaq file.
 - c. After following the instructions to unpack the ROMPaq file, you will see the following in your browser:



This Flash Update Enhanced SoftPaq contains utilities and images that can be used to restore or upgrade the system ROM on Hewlett-Packard ProLiant Servers. Several methods for changing the ROM version on your server may be chosen. Included are the various ways to perform the update. Each folder provided has self-contained files to perform the ROM update and any unwanted folders may be deleted.

IMPORTANT NOTE: All files contained within and created by this Enhanced SoftPaq are specific to this ProLiant Server. Files are not interchangeable with other ProLiant Server families.

- [Create a bootable ROMPAQ USB Key](#)
- [ROMPAQ Flat Files](#)

- [General Descriptions](#)
- [View revision history](#)
- [Web browser notes](#)

General Descriptions

Utilities and appropriate images are contained in each of the directories as follows:

ROMPAQ USB Key – A Windows-based utility to locally partition, format and copy necessary files to a USB flash media device (e.g. HP Drive Key) through the Windows environment.

ROMPAQ Flat Files – Provides flat files of the ROMPAQ media.

- d. Follow the instructions to prepare your USB key with the proper BIOS files for restoration.
-
2. Perform BIOS Recovery:
 - a. Place jumper on J27 - group C pins.
 - b. Insert USB key.
 - c. Power on computer, and wait for the recovery process complete. Wait a minimum of 10 minutes for the process to complete.
 - d. Unplug USB key and remove jumper from J27 - group C pins.
 - e. Restart computer and load BIOS defaults.

Power-On Self Test (POST)

When the server boots up, a series of tests are displayed on the screen. This is referred to as Power-On Self-Test (POST). POST is a series of diagnostic tests that checks firmware and assemblies to ensure that the server is properly functioning. This diagnostic function automatically runs each time the server is powered on.

These diagnostics, which reside in the BIOS ROM, isolate the server-related logic failures and indicate the board or component that needs to be replaced, as indicated by the error messages. Most server

hardware failures are accurately isolated during POST. The number of tests displayed depends on the configuration of the server.

During POST you can:

- Press **ESC** to skip the HP logo and go to POST boot progress display system summary screen.
- Press **F10** to access the Setup Utility.
- Press **F12** to request a network boot (PXE).
- Press **F1** to continue POST after POST errors are detected.

POST error indicators

When POST detects a system failure it displays a POST error message.

Recoverable POST errors

When a non-fatal error occurs during POST, the screen will display an error message with the format “xxx-Error Identifier String” where “xxx” is a unique number code that matches ODM system specific error documentation and may be a hexadecimal or decimal value.

All Error messages describe the problems as shown below:

Table 23 POST Error Messages

Error code	Description
10	Floppy Controller Failure
00B	CMOS Memory Size Wrong
00C	RAM R/W test failed
003	CMOS Battery Low
005	CMOS Checksum Bad
040	Refresh timer test failed
041	Display memory test failed
048	Password check failed
120	\$A0CCMOS Cleared by Jumper. Restore the Jumper and Continue...
122	\$A0CPASSWORD Cleared By Jumper. Restore the Jumper and Continue...
150	Processor failed BIST
160	Processor missing microcode:
192	L3 cache size mismatch
193	CPUID, Processor stepping are different
194	CPUID, Processor family are different
195	Front side bus mismatch. System halted.
196	CPUID, Processor Model are different
197	Processor speeds mismatched

Table 23 POST Error Messages

Error code	Description
198	Processor QPI speed mismatch detected.
601	Error: BMC Not Responding
605	BMC Has Detected Fatal Hardware Error
611	Internal User Area Of BMC FRU Corrupted
612	Controller Update 'boot block' Firmware Corrupted
613	Controller Operational Firmware Corrupted
620	Non-Redundant Fan Failure or Missing
621	Redundant Fan Configuration, One Fan Failure or Missing
622	Redundant Fan Configuration, Multiple Fans Failure or Missing
623	Temperature Violation Detected Waiting 5 minutes for system to cool Press ESC Key to resume booting without waiting for the system to cool Warning: Pressing ESC is NOT recommended as the system may shutdown unexpectedly
624	Power Supply Failure or Power Supply Unplugged
626	Update SDRR/Configuration Image failed
627	Invalid or Unknown SKU/Chassis ID Please check Front panel, System ID Jumper or Riser card Press F1 to Continue
628	Redundant Power Supply Mismatch
701	Insufficient Runtime space for MPS data.!!. System may operate in PIC or Non-MPS mode.
702	No enough APIC ID in range 0-0Fh can be assigned to IO APICs. (Re-assigning CPUs' local APIC ID may solve this issue) MPS Table is not built! System may operate in PIC or Non-MPS mode.

POST-related troubleshooting

Perform the following procedures when POST fails to run, error messages are displayed.

If the POST failure is during a routine boot up, verify the following conditions:

- All external cables and power cables are firmly plugged in.
- The power outlet to which the server is connected is working.
- The server and monitor are both turned on. The bicolor power status LED indicator on the ear must be green.
- The monitor's contrast and brightness settings are correct.
- All internal cables are properly connected and all boards firmly seated.
- The processor is fully seated in its socket on the system board.
- The heat sink assembly is properly installed on top of the processor.

- All memory modules are properly installed.
- If you have installed a PCI accessory board, verify that the board is firmly seated and any jumpers on the board are properly set. Refer to the documentation provided with the accessory board.
- All internal cabling and connections are in their proper order.
- If you have changed the jumper on the system board, verify that each is properly set.

If the POST failure occurs after installing an accessory, perform the following steps:

1. Perform the pre-installation procedure described on page 45.
2. If necessary, remove any expansion boards, assemblies, or cables that prevent access to the system components.
3. Check the following conditions:
 - a. If you have installed an expansion board, verify that the board is firmly seated in its slot and any switches or jumpers on the board are properly set. Refer to the documentation provided with the expansion board.
 - b. All internal cabling and connections are in their proper order.
 - c. If you have changed any jumper block on the system board, verify that each one is properly set.
4. Perform the post-installation procedure described on page 46.
5. Turn on the monitor.
6. If the server still does not work, repeat step 2.
7. Remove all accessories, except the primary boot hard disk drive.
8. Repeat steps 4 and 5.

If the server now works, replace the boards and accessories one at a time to determine which one is causing the problem.

OS installation

Supported OSes

Refer to the operating system support matrix (<http://www.hp.com/go/supportos>).

OS pre-installation procedure

Perform the two pre-OS installation steps in this section before installing the OS of your choice.

1. Configure the hardware aspect of the server.
2. Update the server BIOS.

Hardware setup

Prepare the server following the instructions in the HP ProLiant DL288 G6 Server Installation Sheet.

It is recommended that you do not install any third party adapter until you verify that the HP equipment is functioning properly and you complete the OS installation.

Your HP ProLiant DL288 G6 server comes with new hard disk drive(s) that do not need specific setup. However, if you install additional used hard disk drives in your new server:

- Note that most OS installations remove all data from the hard disk on which they are installed. If you want to use additional hard disk drives to access existing data in the new server, HP recommends that you install and configure any of these hard drives after completing the OS installation.
- If you want to recycle used hard drives, use a utility such as disk to erase all data and partitions from that particular hard drive.

BIOS update

HP recommends that you update the server BIOS with the latest system BIOS version to take advantage of the most recent compatibility fixes. The latest BIOS version for your server can be downloaded from <http://www.hp.com>.

Server management

Pre- and post-installation procedures

Pre-installation procedures

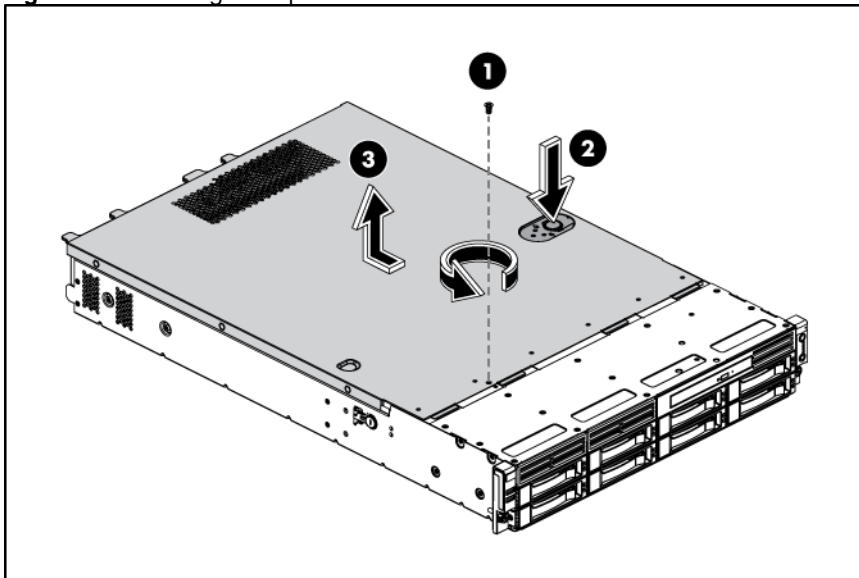
⚠ WARNING: Failure to properly turn off the server before you open the server or before you start removing or installing hardware components may cause serious damage as well as bodily harm.

⚠ WARNING: To reduce the risk of personal injury from hot surfaces, allow the chassis and any installed hardware components to cool before touching them.

⚠ CAUTION: Follow the ESD precautions listed in Chapter 2 of the HP ProLiant DL288 G6 Server Maintenance and Service Guide when handling any hardware component.

1. Turn off the server and all the peripherals connected to it.
2. Disconnect the AC power cord from the power supply cable located on the server rear panel to turn off the service processor and reduce the risk of electrical shock.
3. Remove the top cover from the chassis:
 - a. Loosen the screw on the top cover with a T-10 wrench.
 - b. Press the latch on the top cover.
 - c. Slide the cover toward the rear of the server, and then lift the cover away from the chassis.

Figure 21 Removing the top cover



4. Place the top cover in a safe place for reinstallation later.

Post-installation procedures

1. Be sure all components are installed according to the described step-by-step instructions.
2. Check to make sure you have not left loose tools or parts inside the server.
3. Reinstall any expansion boards, riser board assemblies, peripherals, board covers, brackets, and system cables that you have removed.
4. Reinstall the top cover:
 - a. Align the top cover to the chassis and then slide it towards the front panel to position it into place.
 - b. Tighten the screw on the top cover.
5. Tighten the screw on the top cover.
6. Connect all external cables and the AC power cord to the system.
7. Route the cables properly through the available cable management arrangement.
8. Press the power button on the front panel to turn on the server.

Configuring the BMC

The server includes a BMC for systems management, which you can access through a 10/100 Mbps LAN port for IPMI management. To access the BMC through this LAN port, you must configure the IP address. You can configure the LAN settings for the BMC in the BIOS Setup.

To configure the BMC (LAN) through the BIOS Setup:

1. In the **Advanced-->IPMI Configuration-->Set LAN Configuration** submenu, set the **BMC NIC Allocation** field to select which connection the BMC uses for the IPMI LAN interface. .
2. In the **Advanced-->IPMI Configuration-->Set LAN Configuration** submenu, set the **IP address** and **Subnet Mask** for the BMC. In the **BMC LAN Configuration** field, you can use Static to set the address manually or use DHCP to set the address automatically.
3. Press **F10** to save and exit.

BMC Recovery Steps

For BMC Recovery, perform the following steps:

1. Disconnect AC power from the system.
2. Insert jumper on connector J27 (D group pins) on the system board.
3. Update BMC firmware using HP ROMPaq Firmware Upgrade for HP ProLiant G6 Lights-Out 100 Remote Management (For USB Key-Media). Detailed information is available at the following Web page:<http://h20000.www2.hp.com/bizsupport/TechSupport/SoftwareDescription.jsp?lang=en&cc=us&prodTypeId=15351&prodSeriesId=3884343&swItem=MTX-bd27c5aa4f134285aa4825e143&prodNameId=3884344&swEnvOID=1005&swLang=13&taskId=135&mode=4&idx=1>
4. After BMC recovery is complete, remove USB key.
5. Remove AC power and remove the recovery jumper on J27 (D group pins).

SETSYS Utility

SETSYS EXE (DOS application) is the correct tool for setting the Serial Number/Asset Tag text on this server after a system board replacement has occurred.

Once the Serial Number/Asset Tag text has been entered via SETSYS, populating the SMBIOS data, the system BIOS will automatically write this info into BMC IPMI FRU data on the next boot up. For the detailed command, refer to the below:

Command Line: SETSYS [/S|/U|/A|/M|/K|/?] <string>

/S - Set Serial Number	S/N has a MAX length of 16 chars (16 digits). (e.g. SETSYS /S=1234567890XYZEFG)
/U – Set UUID	UUID must be exactly 16 Bytes (32 digits) in length. Digits must be 0-9 and A-F (CAPS) only. (e.g. SETSYS /U=1234567890ABCDEF1234567890ABCDEF)
/A - Set Chassis Asset Tag	Asset Tag has a MAX length of 16 chars (16 digits). (e.g. SETSYS /A=MAINSERVER123456)
/M - Set Manufacturer String	Manufacturer string has a MAX length of 16 chars. (e.g. SETSYS /M=HP)
/K - Set SKU ID String	SKU Number String has a MAX length of 16 chars. (e.g. SETSYS /K=AG655A)
/? - Help	

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